FTLX8541E2-AO

10Gbs X2 Transceiver

Features

- Compatible with X2 MSA Rev2.0b
- Support of IEEE 802.3ae 10GBASE-SR at 10.3125Gbps
- Transmission Distance up to 300m (MMF)
- Vertical Cavity Surface Emitting Laser at 850nm
- SC Duplex Optical Connector
- Hot Pluggable 70-PIN Connector with XAUI Electrical Interface
- Management and control via MDIO 2-wire interface
- Power Supply: +3.3V, APS (+1.2V)
- Diagnostic Optics Monitoring
- Temperature Range: 0~ 70 °C
- ROHS6 Compatible

Applications

- 10GE Ethernet switches and routers
- 10GE Core-routers
- 10GE Storage
- Other 10Gbps Ethernet Transmission System

Product Description

AddOn Computer's FTLX8541E2-AO transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). The SFP+ transceivers are high performance, cost effective modules supporting dual data-rate of 10Gbps and support distance up to 300m with MMF.

AddOn Computer's X2 transceivers are RoHS compliant and lead-free

Pin Descriptions

Pin	Symbol	Name/Descriptions	Ref.
1	GND	Electrical Ground.	1
2	GND	Electrical Ground.	1
3	GND	Electrical Ground.	1
4	5.0V	Power	2
5	3.3V	Power	2
6	3.3V	Power	2
7	APS =1.2V	Adaptive Power Supply.	2
8	APS =1.2V	Adaptive Power Supply.	2
9	LASI	Open Drain Compatible 10K-22K pull up on host. Logic High: Normal Operation Logic Low: LASI Asserted	3
10	RESET	Open Drain compatible. 10-22K pull-up on transceiver Logic high = Normal operation Logic low = Reset Minimum reset assert time 1 ms	3
11	VEND SPECIFIC	Vendor Specific Pin. Leave unconnected when not in use.	6
12	TX ON/OFF	Open Drain compatible. 10-22K pull-up on transceiver Logic high = Transmitter On (capable) Logic low = Transmitter Off (always)	3
13	RESERVED	Reserved	
14	MODE DETECT	Pulled low inside module through 1k	3
15	VEND SPECIFIC	Vendor Specific Pin. Leave unconnected when not in use.	6
16	VEND SPECIFIC	Vendor Specific Pin. Leave unconnected when not in use.	6
17	MDIO	Management Data IO	3,4
18	MDC	Management Data Clock	3,4
19	PRTAD4	Port Address Bit 4 (Low = 0)	3
20	PRTAD3	Port Address Bit 3 (Low = 0)	3
21	PRTAD2	Port Address Bit 2 (Low = 0)	3
22	PRTAD1	Port Address Bit 1 (Low = 0)	3
23	PRTAD0	Port Address Bit 0 (Low = 0)	3
24	VEND SPECIFIC	Vendor Specific Pin. Leave unconnected when not in use.	6
25	APS SET	Feedback input for APS	

26	RESERVED	Reserved for Avalanche Photodiode use.	6
27	APS SENSE	APS Sense Connection	
28	APS =1.2V	Adaptive Power Supply	2
29	APS =1.2V	Adaptive Power Supply	2
30	3.3V	Power	2
31	3.3V	Power	2
32	5.0V	Power	2
33	GND	Electrical Ground	1
34	GND	Electrical Ground	1
35	GND	Electrical Ground	1
36	GND	Electrical Ground	1
37	GND	Electrical Ground	1
38	RESERVED	Reserved	
39	RESERVED	Reserved	
40	GND	Electrical Ground	1
41	RX LANE0+	Module XAUI Output Lane 0+	5
42	RX LANE0-	Module XAUI Output Lane 0-	5
43	GND	Electrical Ground	1
44	RX LANE1+	Module XAUI Output Lane 1+	5
45	RX LANE1-	Module XAUI Output Lane 1-	5
46	GND	Electrical Ground	1
47	RX LANE2+	Module XAUI Output Lane 2+	5
48	RX LANE2-	Module XAUI Output Lane 2-	5
49	GND	Electrical Ground	1
50	RX LANE3+	Module XAUI Output Lane 3+	5
51	RX LANE3-	Module XAUI Output Lane 3-	5
52	GND	Electrical Ground	1
53	GND	Electrical Ground	1
54	GND	Electrical Ground	1
55	TX LANE0+	Module XAUI Input Lane 0+	5
56	TX LANE0-	Module XAUI Input Lane 0-	5
57	GND	Electrical Ground	1
58	TX LANE1+	Module XAUI Input Lane 1+	5
59	TX LANE1-	Module XAUI Input Lane 1-	5
60	GND	Electrical Ground	1

61	TX LANE2+	Module XAUI Input Lane 2+	5
62	TX LANE2-	Module XAUI Input Lane 2-	5
63	GND	Electrical Ground	1
64	TX LANE3+	Module XAUI Input Lane 3+	5
65	TX LANE3	Module XAUI Input Lane 3	5
66	GND	Electrical Ground	1
67	RESERVED	Reserved	
68	RESERVED	Reserved	
69	GND	Electrical Ground	1
70	GND	Electrical Ground	1

Notes:

1. Ground connections are common for TX and RX.
2. All connector contacts are rated at 0.5A nominal.
3. 1.2V CMOS compatible.
4. MDIO and MDC timing must comply with IEEE802.3ae, Clause 45.3.
5. XAUI output characteristics should comply with IEEE802.3ae Clause 47.
6. Transceivers will be MSA compliant when no signals are present on the vendor specific pins.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Ambient Temperature Range	TS	-40	85	°C
Power Case Temperature Range		0	70	°C
Adaptable Power Supply	Vapsense	0	1.5	V
Supply Voltage Range @ 3.3V	Vcc3	-0.5	4.0	V

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	V_{CC3}	3.14	3.30	3.47	V
	V_{APS}	1.152	1.2	1.248	
Operating Case Temperature	Tc	0		70	°C
Power Dissipation	PD		1.7	2.4	W

Signal Specification- Electrical

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
1.2 V CMOS						
Input High Voltage	VIL(MAX)			0.36	mV	
Input Low Voltage	VIH(MIN)	0.84		1.25	Ω	
Capacitance				320	V	
Pull Up Resistance	Rpull	4.7k	10k	22k	V	
MDIO I/O						
Output Low Voltage	VOL	-0.3		0.2	V	
Output Low Current	IOL			4	mA	
Input High Voltage	VIH	0.84		1.5	V	
Input Low Voltage	VIL	-0.3		0.36	V	
Pull-up Supply Voltage	VPULL	1.14	1.2	1.26		
Input Capacitance	CIN			10	Pf	
Load Capacitance	CLOD			470	Pf	
External Pull-up Resistance	EPULL	200			Ohm	

Optical Characteristics

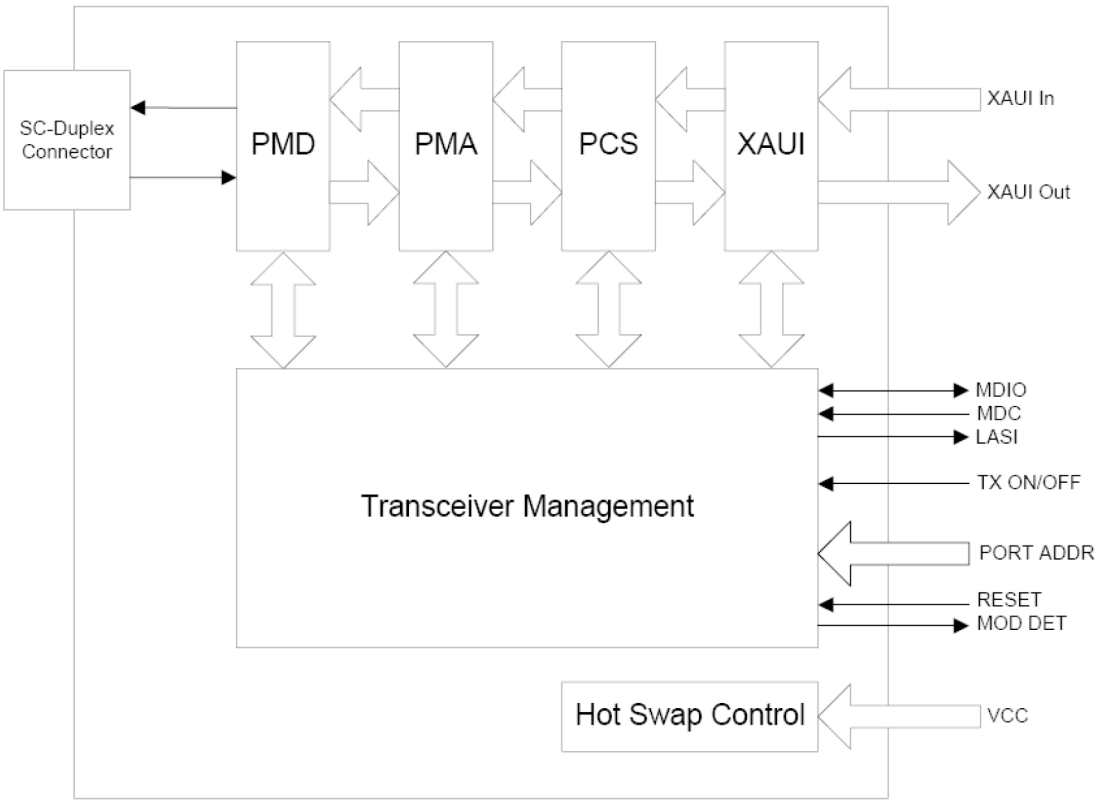
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Operating Range				300	m	
Operating Date Rate			10.3125		Gb/s	
Average Optics Power	Po	-6.5		-1	dBm	
Input Centre Wavelength	λ	840	850	860	nm	
Spectral Width	Δ λ		0.4	0.45	dB	
Extinction Ratio	ER	3.5				
Optical Modulation Amplitude	OMA	525			µW	
Transmitter and Dispersion Penalty	TDP			3.2	dB	
Receiver						
Operating Date Rate			10.3125		Gb/s	
Average Receiver Power	Po	-9.9		-1.0	dBm	
Sensitivity in OMA	OMA0			-11.1	dBm	1
Stressed Sensitivity in OMA	OMAst			-7.5	dBm	

Notes:

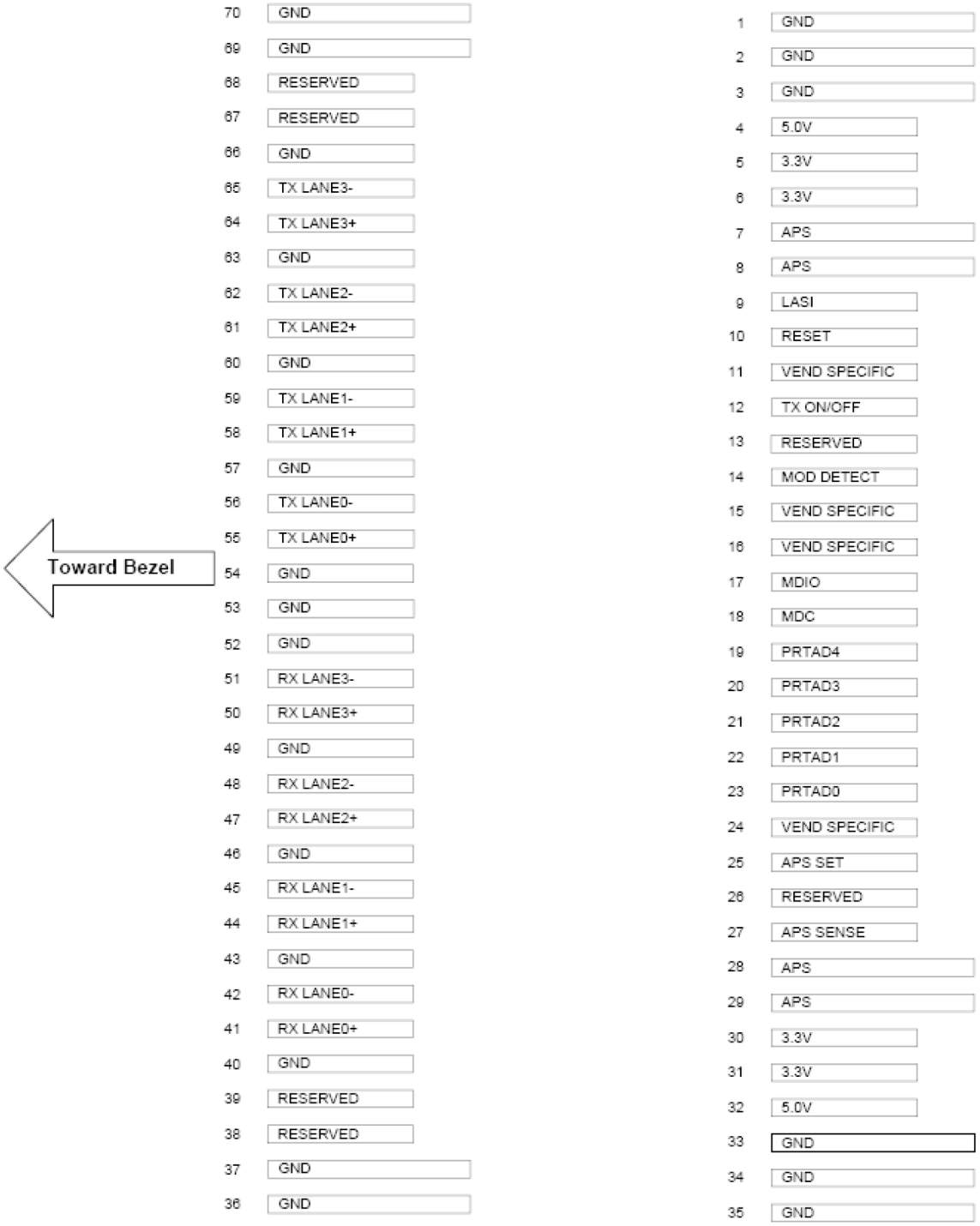
1. Measured at 10.3125Gb/s,Non-framed PRBS2^31-1,NRZ.

XAUI I/O Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
XAUI Date Rate	DR		3.125		Gb/s	
XAUI Baud Rate Tolerance		-100		100	Ppm	Relative Tolerance
Differential Input Voltage Swing		220		1600	Mv	8B/10B Coded Input Signal
Differential Output Voltage Swing		800		1600	mVp-p	RLOAD = 100Ω ± 5%
Differential Input Impedance		80	100	120	Ω	
Total Output Jitter	TJXAUI			0.35	UI	No pre-equalization
Total Deterministic Output Jitter	DJXAUI			0.17	UI	No pre-equalization

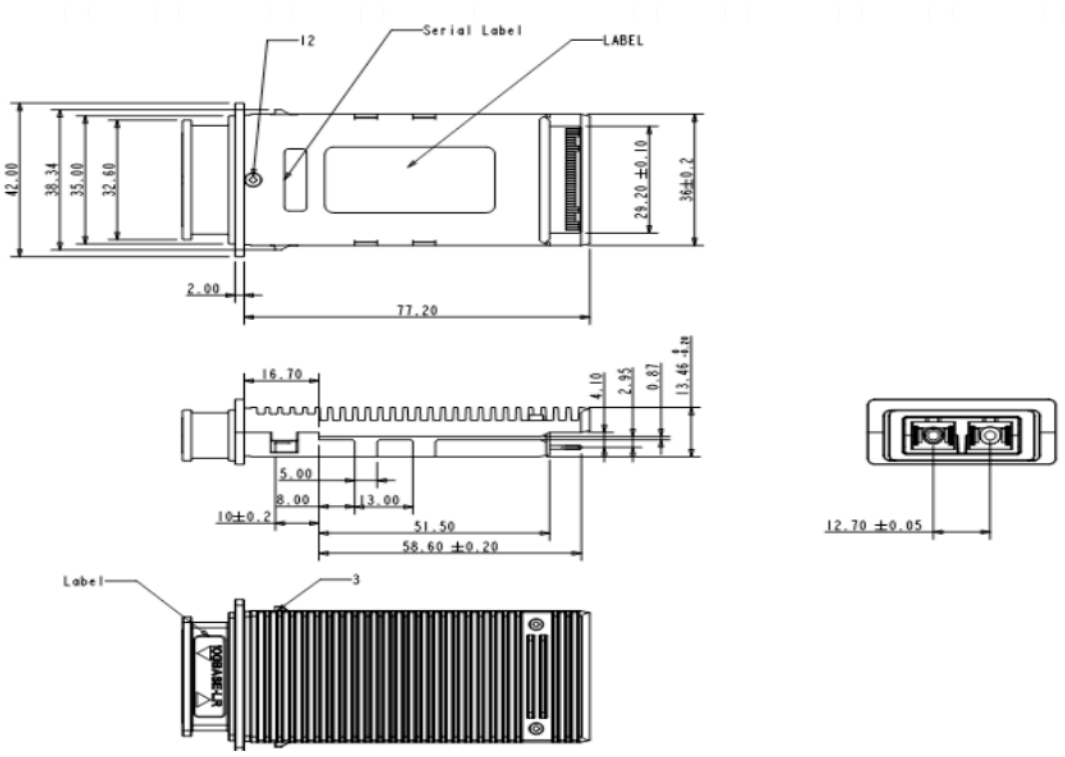


Functional Diagram of Typical XENPAK Style Transceiver



Electrical Pin-out Details

Mechanical Dimensions



Dimensions in mm

Regulatory Compliance

XENPAK Transponder is designed to be Class I Laser safety compliant and is certified per the following standards:

Parameter	Range	Accuracy	Calibration
Laser Safety	FDA	CDRH 21 CFR 1040 and Laser Notice No. 50	1120291-000
Product Safety	UL	UL and CUL EN60950-2:2007	WT10093765-D-E-E
Environmental Protection	SGS	RoHS Directive 2002/95/EC	GZ1001008706/CHEM
EMC	WALTEK	EN 55022:2006+A1:2007 EN 55024:1998+A1+A2:2003 -	WT10093768-D-E-E

Contact Information

AddOn Computer, Inc. is a leading supplier of Memory Upgrade, Network Transceivers and Network connectivity products to Channel Partners, Resellers and OEMs, with more than seventeen years of direct industry experience. AddOn Computer has been the exclusive supplier to Ingram Micro's "Memory Upgrades" program for the past nine years.

AddOn Computer maximizes profitable opportunities for our partners. Our ability to source product worldwide, ensures that our pricing will always be competitive. Offering turnkey solutions, AddOn Computer has forged a reputation as a solutions provider, delivering high quality, cost effective product in a timely and reliable manner.

Corporate office:
AddOn Computer
30400 Esperanza
Rancho Santa Margarita, CA 92688

Tel: 877-292-1701
Fax: 949-266-9273
Email: sales@addoncomputer.com
Email: support@addoncomputer.com
Web: http://www.addoncomputer.com